1230

2519

UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

OCT 17 1972

RDT OSR (ORNL)
Violet

Milton Shaw, Director
Division of Reactor Development & Technology

RADIOACTIVE EFFLUENT RELEASES AT ORNL

This is in reply to your question of August 21, 1972 regarding effluent releases at ORNL as shown in memo from Martin Biles, OS to Heads of Divisions and Offices, August 9, 1972, namely;

1. Why should ORNL be releasing so much?

2. What is priority of program inducing this?

Frank Coffman of OS was asked for all the information he had; it turned out to be not quite enough. R. L. Philippone was then given all this information and asked if he could help; see Enclosure 1.

This answer is that isotopes production program is probably the largest contributor to the total curie release; that is, to the 80,000 (plus) curies of Kr + Xe. Further, it is believed that the 80,000 curies of Kr + Xe is a gross upper bound and the actual reading is much less, probably about 8000 curies. That is, the entry in the OS table on PEIS 02 should read, "less than 100,800 curies".

The method of estimating Xe-Kr release from ORNL stacks is based upon the assumption that the activity composition in the stack is always that which results in the minimum possible MPC from fission produced nuclides of these species. This is very rarely the case, however, the assumption is used to determine the ratio of activity concentration in the atmosphere to this MPC and therefore always produces a conservative (pessimistic) estimate of this ratio. ORNL does not have the capability to measure individual feeder streams to the stack and furthermore they cannot measure the actual krypton to xenon ratio in the total stream. The ratio method used by ORNL works fine in power plants where this mixture is consistent but in doing the experimental work at ORNL and the use of different production rates at the isotope division makes for a very inconsistent mixture. The measurements are not made for the purpose of actually determining the ratio of noble gas release, but to establish an upper bound for the release in order to make the MPC ratio estimate. The actual releases in curies are believed to be only a small fraction of the 80,000 curies per year upper bound quoted.

If the release were actually as high as 80,000 curies, it would amount to less than 3% of permissible, as found in AEC Manual Chapter 0524.

It is believed our LMFBR program contributes very little; most of what it does contribute now comes from small-scale dissolution experiments of irradiated LMFBR-type fuel.

Other programs contributing are

Bulk shielding reactor
Transuranium isotope production - TRU
High Flux Irradiation Reactor - HFIR
Studies for recovery of HTGR and Shippingport fuels

With respect to priority, I would rate our LMFBR work (a small contribution to effluent releases) as high priority; I am unable to set a priority rating on the other programs.

Additional details are given in Enclosure 2.

W. H. McVey, Chief
Fuel Recycle Branch

RDT:RT:FR-128

Enclosures:
1. Informal Note
2. Information from R. L. Philippone by phone

cc: AD/NS
AD/ES
Chief, Operations Support Branch, RDT:ES
RDT Sr. Site Rep., ORNL
R. L. Philippone, RDT Site Rep., ORNL

Enclosure 1

AUG 2 3 1972

INFORMAL NOTE

R. L. Philippone, RDT
Site Rep., ORNL

RADIOACTIVITY RELEASES AT ORNL

Note question by M. Shaw and (?) on PEIS 02. The attached table "Radioactive Releases at ORNL" was provided by Frank Coffman of OS.

This report is being distributed largely to show the addressees what OS is planning. Most of the numbers are dummy numbers and have no meaning; it just happens that the ORNL numbers are real numbers.*

The table does not contain quite enough information to answer Mr. Shaw's question about the priority of the program since Coffman does not know what program is producing the radioactivity. Do you think you could help? What is going on in 3019; for example, how much of the 82,300 is coming from 3019 in 4500N Wing 1?

On PEIS 14 the whole business is fictitious.

Bill McVey, Chief
Fuel Recycle Branch

*Note there are two sets of "real" numbers. ORNL was asked by OS to supply information on total gaseous releases; this turned out to be 91,300 curies. They were then asked to supply more detail; the total of these releases (4500 + 82,300 + 8600 + 30) add up to 95,400 curies.

Radioactive Releases at ORNL

Calendar Year 1970

Source	Radioactivity	Gaseous Curies	Liquid Curies
MSR	Tritium	4500	
Burial Ground + all other Operations	Tritium		9500
3019 + 4500-N-Wing 1	Kr + Xe	82,300	
7900 + 7970 + 7930	Kr + Xe	8600	
All Sources	I-131	30	
Central Waste Treatment	Sr-90		2*
Waste Burial Ground	Sr-90		2*

*The total of 4 curies (actually 3.9 curies) discharged over White Oak Dam is the limiting activity; 3.9 curies = 1.2 X RCG (Radioactivity Concentration Guide).

Enclosure 2

Information Received by Telephone from R. L. Philippone*
August 30, 1972

There are four stacks at ORNL used to discharge gaseous effluents. One stack handles effluents from buildings 3047, 3028 and 4500 complex and includes discharges from isotopes processing, the ORR and the Bulk Shielding Reactor and the hot cells in 4507 building. Another stack includes discharges from the 7900's buildings including HFIR, TRU and HTGR experimental work. A third stack from building 2026, the High Level Analytical Laboratory and a forth stack serves building 3019 which includes discharges from Shippingport fuel recovery studies.

The discharges from several areas enter a single stack but are monitored only as they leave the stack and not as they enter so at present there is no quantitative measurement of the contributions to the total from each program. Qualitatively, it is possible to say that most of the Kr-Xe activity comes from the isotopes program.

*Not covered in the memo proper.